FORM PTO-1390 (Modified) (REV 11-98) MAR 2 9 2001 U.S. DEPARTMENT OF COMMERCE-PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371	PF980067
	U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 09/806393

INTERNATIONAL APPLICATION NO. PCT/FR99/02380	INTERNATIONAL FILING DATE 05October1999(05.10.99)	PRIORITY DATE CLAIMED 05October1998(05.10.98)

TITLE OF INVENTION

METHOD AND DEVICE FOR SERVICE DATA MANAGEMENT IN A TELEVISION SYSTEM

APPLICANT(S) FOR DO/EO/US

Louis Chevallier, Olivier Dehoux, Eric Deniau

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.

3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).

4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))

    a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).

    b. ☒ has been transmitted by the International Bureau.

    c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).

6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).

7. ☒ A copy of the International Search Report (PCT/ISA/210). attached to Item 13

8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))

    a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).

    b. ☐ have been transmitted by the International Bureau.

    c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.

    d. ☒ have not been made and will not be made.

9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).

10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).

11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).

12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98. with references attached

14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

15. ☒ A FIRST preliminary amendment.

16. ☐ A SECOND or SUBSEQUENT preliminary amendment.

17. ☐ A substitute specification.

18. ☐ A change of power of attorney and/or address letter.

19. ☒ Certificate of Mailing by Express Mail 20. Return postcard receipt

20. ☒ Other items or information: **CERTIFICATE OF MAILING UNDER 37 CFR 1.10**

EL682442091US	March 29, 2001
"Express Mail" mailing no.	Date of Deposit

I hereby certify that this application is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

DAVIDA FORNAROTTO	_(signature)_
Typed or printed name of person mailing application	Signature of person mailing application

PCTUS1/REV03

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 09/806393	INTERNATIONAL APPLICATION NO. JC14 Rec'd PCT/FR99/02380	ATTORNEY'S DOCKET NUMBER PF980067 27 MAR 200

21.   The following fees are submitted:.   *A/D 581/860.00* | CALCULATIONS   PTO USE ONLY

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO $1000.00

☒ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO $860.00

☐ International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO $710.00

☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) $690.00

☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00

ENTER APPROPRIATE BASIC FEE AMOUNT = | 860.00

Surcharge of $130.00 for furnishing the oath or declaration later than   ☐ 20   ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	8 - 20 =	0	x $18.00	
Independent claims	2 - 3 =	0	x $80.00	
Multiple Dependent Claims (check if applicable).			☐	

TOTAL OF ABOVE CALCULATIONS   = | 860.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).   ☐

SUBTOTAL   = | 860.00

Processing fee of $130.00 for furnishing the English translation later than   ☐ 20   ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).   +

TOTAL NATIONAL FEE   = | 860.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).   ☐

TOTAL FEES ENCLOSED   = | 860.00

Amount to be: refunded	$
charged	$ 860.00

☐   A check in the amount of   to cover the above fees is enclosed.

☒   Please charge my Deposit Account No. 07-0832   in the amount of $860.00   to cover the above fees. A duplicate copy of this sheet is enclosed.

☒   The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 07-0832   A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Mr. Joseph S. Tripoli
THOMSON multimedia Licensing Inc.
Patent Department
PO Box 5312
Princeton, New Jersey 08540

SIGNATURE

FREDERICK A. WEIN
NAME

27,168
REGISTRATION NUMBER

March 29, 2001
DATE   3/29/01

PCT INITIAL PROCESSING
APR 2 2001
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Page 2 of 2

EXPRESS MAIL LABEL NO. EL682442091US   PF980067

09/ 806393

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Louis Chevallier, Olivier Dehoux, Eric Deniau
Filed	:	Herewith
For	:	METHOD AND DEVICE FOR SERVICE DATA MANAGEMENT IN A TELEVISION SYSTEM

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Sir:

In the US national phase application of PCT/FR99/02380 filed herewith, please enter the following amendments:

IN THE TITLE:

Please amend the title of the application to read "METHOD AND DEVICE FOR SERVICE DATA MANAGEMENT IN A TELEVISION SYSTEM".

IN THE SPECIFICATION:

Please amend the specification as follows: A marked up version of the amended specification is attached herewith:

Page 1, delete the title on lines 1 and 2, and insert -- METHOD AND DEVICE FOR SERVICE DATA MANAGEMENT IN A TELEVISION SYSTEM --.

Page 1, after the title, insert the following paragraph:

-- This application claims the benefit of French application serial no. 98/12465 filed October 5, 1998, which is hereby incorporated herein by reference, and which claims the benefit under 35 U.S.C. § 365 of International Application PCT/FR99/02380, filed October 5, 1999, which was published in accordance with PCT Article 21(2) on April 13, 2000 in French.--

Page 1, line 3, insert -- FIELD OF THE INVENTION --;
Page 1, line 13, insert -- BACKGROUND --;

1

Page 3, line 19, delete "Summary of the Invention" and on line 23, insert -- SUMMARY OF THE INVENTION-- ;

Page 3, amend lines 26 – 33 as follows:

The subject of the invention is a process for managing service data in a television system in which the said service data are transmitted, comprising a step of acquiring information containing a list of broadcast services and supplementary data relatives to these services and of storing the acquired information in a first database of a receiver;

the process is characterized in that it comprises the step:

-of copying information stored in the said first database to a second database of the receiver for the updating of the said second base;

Page 3, after line 35, insert:

-- - when the acquired list of broadcast services changes, of acquiring new list of services in the first database, and of copying acquired list of broadcast service to the second database when the entire list has been acquired in the first database.--

Page 4, line 37, after the word "steps" insert --of: when a service changes,-- ;

Page 5, delete lines 1-6;

Page 5, amend lines 11-17 as follows:

-        " The subject of the invention is also a television receiver in a television system with transmission of service data, comprising:

means for acquiring information containing a list of broadcast service and supplementary data relatives to these services;

-    means for storing information in a first service database;

characterised in that it comprise:

-        means for copying the acquired list of broadcast service to a second database;

-    detection means of a change of list of broadcast service, the detection means controlling the means for copying the list of broadcast service;

Page 5, between lines 19 and 20, insert – BRIEF DESCRIPTION OF THE DRAWINGS --;

Page 5, line 25, delete -- Description of the figures --;

Page 6, line 7, delete "Detailed description of the invention" and insert -- DETAILED DESCRIPTION --;

Page 13, amend lines 30 – 39 as follows:

-- The database can be divided into two parts. The first part (300.1) relates to the acquisition of the information from the service module (360) of the Open TV system and also to the processing of advisory messages so that the information received and stored in this first part is not stable but is constantly evolving with the updating of the stream. The second part (300.2) stores the image of these data, this image being intended for restitution at the user. It is controlled by the acquisition part, and the data are swapped from --.

IN THE CLAIMS:

Please cancel claims 1-7 and add the following claims 8-15.

8. (ADDED) Process for managing service data in a television system in which the said service data are transmitted, comprising a step of acquiring information containing a list of broadcast services and supplementary data relatives to these services and of storing the acquired information in a first database of a receiver;
the process comprises the step of :
- of copying information stored in the first database to a second database of the receiver for the updating of the said second base;
- of making the data stored in the said second database available to at least one application of the said receiver.
- when the acquired list of broadcast services changes, of acquiring new list of services in the first database, and of copying acquired list of broadcast service to the second database when the entire list has been acquired in the first database.

9.(ADDED) Process according to Claim 8, wherein the updating of the second database is performed immediately after acquiring a service datum.

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10.(ADDED) Process according to Claim 8, wherein at the updating of the second database is performed after a predetermined time interval after a request for acquisition of a service datum.

11.(ADDED) Process according to Claim 9, wherein the updating of the second database is performed after a predetermined time interval after a request for acquisition of a service datum.

12.(ADDED) Process according to Claim 8, wherein the updating of the second database is performed only following a request of an application.

13.(ADDED) Process according to Claim 9, wherein the moment of the update according to Claim 2 is dependent on the type of the service datum.

14.(ADDED) Process according to claim 8, wherein it furthermore comprises the steps of :
    - when a service changes, acquiring new supplementary information relating to this service and suspending the updating of the second base with the new supplementary information until a request of an application.

15 (ADDED) Television receiver in a television system with transmission of service data, comprising :
    - means for acquiring information containing a list of broadcast service and supplementary data relatives to these services ;
    - means for storing information in a first service database ;
wherein it comprises:
    - means for copying the acquired list of broadcast service to a second database ;
    - detection means of a change of list of broadcast service, the detection means controlling the means for copying the list of broadcast service ;
    - means for suspending and resuming updating of the second database from the first database.

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IN THE ABSTRACT:

Please add the following Abstract.

-- The subject of the invention is a process for managing service data in a television system in which the said service data are transmitted. The process comprises the steps:

    - of acquiring service data and of storing the data acquired in a first database of a receiver;

    - of copying service data stored in the said first database to a second database of the receiver for the updating of the said second base;

    - of making the data stored in the said second database available to at least one application of the said receiver.

The subject of the invention is also a television receiver implementing the above process.--

REMARKS

The title has been amended to conform with the translated title of the published application (WO 00/21285).

The specification has been amended to include a reference to the priority applications and to meet the requirements of the United States.

To meet the requirements of the United States, the Abstract (as originally filed in the PCT application) is added.

No fee is believed to have been incurred by virtue of this amendment. However if a fee is incurred on the basis of this amendment, please charge such fee against deposit account 07-0832

Respectfully submitted,
Louis Chevallier
Olivier Dehoux
Eric Deniau

Frederick A. Wein
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609/734-9518

THOMSON multimedia Licensing Inc.
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PO Box 5312
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March 29, 2001

<u>MARKED UP VERSION OF THE AMENDED SPECIFICATION</u>

Page 1, delete the title on lines 1 and 2, and insert -- METHOD AND DEVICE FOR SERVICE DATA MANAGEMENT IN A TELEVISION SYSTEM --.

Page 1, after the title, insert the following paragraph:

-- <u>This application claims the benefit of French application serial no. 98/12465 filed October 5, 1998, which is hereby incorporated herein by reference, and which claims the benefit under 35 U.S.C. § 365 of International Application PCT/FR99/02380, filed October 5, 1999, which was published in accordance with PCT Article 21(2) on April 13, 2000 in French.</u>--

Page 1, line 3, insert -- FIELD OF THE INVENTION --;

Page 1, line 13, insert -- BACKGROUND --;

Page 3, line 19, delete "Summary of the Invention" and on line 23, insert -- SUMMARY OF THE INVENTION-- ;

Page 3, amend lines 26 – 33 as follows:

The subject of the invention is a process for managing service data in a television system in which the said service data are transmitted, [characterized in that it comprises the steps:

- of acquiring service data and of storing the data acquired in a first data base of a receiver;] <u>comprising a step of acquiring information containing a list of broadcast services and supplementary data relatives to these services and of storing the acquired information in a first database of a receiver;</u>

<u>the process is characterized in that it comprises the step:</u>

-of copying [service data] <u>information</u> stored in the said first database to a second database of the receiver for the updating of the said second base;

Page 3, after line 35, insert:

-- <u>- when the acquired list of broadcast services changes, of acquiring new list of services in the first database, and of copying acquired list of broadcast service to the second database when the entire list has been acquired in the first database.</u>--

Page 4, line 37, after the word "steps" insert --<u>of: when a service changes.</u>-- ;

Page 5, delete lines 1-6;

Page 5, amend lines 11-17 as follows:

" The subject of the invention is also a television receiver in a television system with transmission of service data, [characterized in that is comprise:

- means for acquiring service data;
- means for storing a first service database;
- means for storing a second service database;]

comprising:

- means for acquiring information containing a list of broadcast service and supplementary data relatives to these services;
- means for storing information in a first service database;

characterised in that it comprise:

- means for copying the acquired list of broadcast service to a second database;
- detection means of a change of list of broadcast service, the detection means controlling the means for copying the list of broadcast service;

Page 5, between lines 19 and 20, insert -- BRIEF DESCRIPTION OF THE DRAWINGS --;

Page 5, line 25, delete -- Description of the figures --;

Page 6, line 7, delete "Detailed description of the invention"and insert -- DETAILED DESCRIPTION --;

Page 13, amend lines 30 – 39 as follows:

-- The database can be divided into two parts. The first part (300.1) relates to the acquisition of the information from the service module (360) of the Open TV system and also to the processing of advisory messages so that the information received and stored in this first part is not stable but is constantly evolving with the updating of the stream. The second part (300.2) stores the image of these data, this image being intended for restitution at the user. It is controlled by the acquisition part, and the data are swapped from --.

Process and device for managing service data in a television system

The invention relates to broadcasting and
5   reception of multimedia applications or broadcast
audiovisual transmissions and more particularly to a
process and a device for navigating and for selecting
audiovisual services or stations. These devices and
processes can be based on the signalling which
10   accompanies the data of the audiovisual services or
stations. An example of such signalling is the "DBV
Service Information" standard.

Within the current world of audiovisual, the
effect of the proliferation of stations and services is
15   to offer the user an ever greater and ever more complex
choice. So great in number are they that the range of
stations and services on offer may exceed some one
hundred. So complex in their naming are they that the
user cannot recall the name of all the stations and
20   services. Straightforward association between a number
corresponding to the index number of the station or of
the service with its content is not straightforward
when the number of stations and of services oversteps a
certain limit. Consequently, the user cannot himself
25   memorize all the stations and services nor even
organize these stations or services in his mind.

This proliferation of stations and services has
developed by virtue of the technical advances both in
the means of transmission and in the means of reception
30   of multimedia applications. Specifically, the
information corresponding to multimedia applications is
transmitted by multiplexing data packets in the digital
data stream thus making it possible to increase the
data transmission and reception capacity.

35   In order to allow the user to "navigate" and to
choose from among the stations or services offered to
him, an electronic programme guide is available to him.
This programme guide commonly referred to as the "EPG"

is a software application which can be used in both digital and analogue television environments.

The digital television environment which motivates the present invention is described in detail in the specifications of the DVB (digital video broadcasting) standard. Reference may be made for example to the DVB specifications drawn up by the ETSI (European Telecommunications Standards Institute) published in September 1997 under the reference EN 300 468 - v1.3.1 or under the reference REN/JTC-00DVB-43.

According to this DVB standard, the information relating to programmes and events broadcast is contained in the service information "SI". It is broadcast periodically as a function of the available passband and of the frequency of the requests for information from the user.

Within the framework of the present invention, the user can "navigate" and make his choice by means of the P+ or P- programme buttons of the remote control. These programme buttons make it possible either to increment or to decrement the number of the station or of the service being displayed without having to press the button corresponding to the number.

The incrementation or decrementation can be performed in a sporadic, isolated manner. However, it can also be performed in a continuous manner by keeping the P+ or P- programme button pressed. In the latter case, the choice of the station or of the service is determined only when the pressure on the P+ or P- buttons is released, this zapping is commonly referred to as "virtual zapping" or else "continuous surfing". This virtual zapping exists at present but in an environment where the number of choices is limited and with restricted handleability and efficiency.

Consequently, in order to enable this virtual zapping to meet the user's requirements, it is necessary to implement a device and a process for navigating and for selecting audiovisual services or

stations which operate both in the digital environment and in the analogue environment.

A first constraint which this device and this process for navigation and selection must meet is that of being furnished with an easily accessible memory capable of changing as a function of the data stream broadcast by the transmitter so as to give a stable image for the user interface and to provide the information within the required time.

A second constraint lies in the management of the information received from the transmitter and returned to the user, since virtual zapping requires a large memory size and fast management in order to cope with the changes of stream.

A third constraint lies in the management of the inconsistency which may temporarily occur in the changes of data streams.

Summary of the invention

One of the aims of the invention is to give a stable image of the data streams transmitted whilst also being as faithful as possible to reality.

The subject of the invention is a process for managing service data in a television system in which the said service data are transmitted, characterized in that it comprises the steps:

- of acquiring service data and of storing the data acquired in a first database of a receiver;

- of copying service data stored in the said first database to a second database of the receiver for the updating of the said second base;

- of making the data stored in the said second database available to at least one application of the said receiver.

The use of a dual database, the one intended for acquisition, the other for restitution at local applications, with selective updating of the restitution base by the acquisition base makes it

possible to present a consistent image of the service information to an application.

According to a particular embodiment, the updating of the second database is performed immediately after acquiring a service datum.

According to the type of datum, the updating of the acquisition base may be immediate or otherwise. According to the particular exemplary embodiment set forth later, the data relating to the address of a service are updated immediately, whilst the data of lower priority and importance, or information which is not directly presented to the user, such as summaries or broadcasting schedules, are updated at particular moments, so as not to be an impediment to the consistency of the information presented, for example, within the framework of an electronic programme guide.

According to a particular embodiment, the updating of the second database is performed after a predetermined time interval after a request for acquisition of a service datum.

The implementation of an update after a certain time interval makes it possible to update the restitution base if the wait for the information to be acquired becomes too long.

According to a particular embodiment, the updating of the second database is performed only following a request of an application.

Thus, control of the updates is left to the assessment of an application, this allowing flexible and different management of these updates as a function of the needs and constraints of a particular application.

According to a particular embodiment, the updating according to one of the above modes depends on the type of data.

According to a particular embodiment, the process furthermore comprises the steps:

- of acquiring the list of services broadcast and of supplementary information relating to the services of the said list;

- of storing the information in the first database and of updating the second database;

- should a change of service be detected, acquiring new supplementary information relating to this service and suspending the updating of the second base with the new supplementary information until a request of an application.

The subject of the invention is also a television receiver in a television system with transmission of service data, characterized in that it comprise:

- means for acquiring service data;
- means for storing a first service database;
- means for storing a second service database;
- means for suspending and resuming updating of the second database from the first database.

Other characteristics and advantages of the invention will become apparent through the description of a nonlimiting embodiment. This embodiment is illustrated by the appended figures.

Description of the figures

Figure 1 is a block diagram of a receiver/decoder implementing the process according to the exemplary embodiment.

Figure 2 represents a general view of the environment of the invention and in particular of the situation of the middleware in the architecture of the software.

Figure 3 is a representation of the database of the server service and its interrelations with the software elements of the system.

Figure 4 shows a representation of the server service as an object model with its components and its links with external components. The server service is

that part of the middleware which is mainly concerned with virtual zapping.

Figure 5 represents the internal architecture of the database of the server service as well as its
5 links with the data streams.

Detailed description of the invention

Figure 1 is a block diagram of a
10 receiver/decoder of a digital television signal. The device comprises a tuner 101 linked to a demodulation and error correction circuit 102 which also comprises an analogue/digital converter for digitizing the signals originating from the tuner. Depending on the
15 type of reception, cable or satellite, the modulation used is of the QAM or QPSK type, and the circuit 102 comprises the demodulation means appropriate for the type of reception. The demodulated and corrected data are serialized by a converter 103, connected to a
20 serial input of a demultiplexing and decoding circuit 104.

According to the present example, this circuit 104 is a STi5500 circuit manufactured by ST Microelectronics. The latter comprises, linked to a
25 central 32-bit parallel bus 105, a DVB demultiplexer 106, a microprocessor 107, a cache memory 108, an external memory interface 109, a serial communication interface 110, a parallel input/output interface 111, a chip card interface 112, an audio and video MPEG
30 decoder 113, a PAL and RGB encoder 114 and a character generator 115.

The external memory interface 109 is linked to a 16-bit parallel bus which is respectively linked to a parallel interface 116 of IEEE 1284 type, a random
35 access memory 117 and a "Flash" memory 118. The parallel interface 116 is also connected to an external connector 120 and a modem 121, the latter being linked to an external connector 122.

The serial communication interface 110 is linked to an external connector 123, as well as to the output of an infrared reception subassembly 124 intended to receive signals from a remote control (not illustrated). The infrared reception subassembly is integrated into a front panel of the decoder, which also comprises a display device and control buttons.

The chip card interface 112 is linked to a chip card connector 125.

The audio and video decoder 113 is linked to a 16-Mbit random access memory 126 intended for storing the nondecoded audio and video packets. The decoder transmits the decoded video data to the PAL and RGB encoder 114 and the decoded audio data to a digital/analogue converter 127. The encoder supplies the RGB signals to a SECAM encoder 132, and also provides a video signal in the form of a luminance component Y and of a chrominance component C, these two components being separated. These various signals are multiplexed through a switching circuit 128 to an audio output 129, television output 130 and video recorder output 131.

The route taken by the audio and video data through the decoder is as follows: the demodulated data stream possesses a transport stream format or more simply a "TS" format with reference to the MPEG II Systems standard. This standard possesses the reference ISO/IEC 13818-1. In their header, the TS packets comprise identifiers called PIDs which indicate the elementary stream to which the useful data of the packet pertain. Typically, an elementary stream is a video stream associated with a particular programme, whereas an audio stream of this programme is another one. The data structure used to transport the compressed audio and video data is referred to as an elementary stream packet or else "PES" packet.

The demultiplexer 106 is programmed by the microprocessor 107 so as to extract from the transport stream the packets corresponding to certain values of

PID. The useful data of a demultiplexed packet are, as appropriate, descrambled (if the rights stored by a chip card of the user authorize this descrambling), before storing these data in buffer areas of the

5 various memories of the decoder. The buffer areas reserved for the audio and video PES packets are situated in the memory 126. The decoder 113 reads back these audio and video data depending on its needs, and transmits the decompressed audio and video samples to

10 the encoder 114 and to the converter 127 respectively.

Certain of the circuits mentioned above are controlled in a known manner, for example through a bus of the 12C type.

Figure 2 represents an implementation of the
15 middleware of the decoder in the architecture of the software (or global software of the system) which is based on Open TV (commercial name of an interactive television system). The middleware is defined as that part of the software situated just below the user
20 interface. Its structure does not stem from the type of navigation and it is required to provide the means of control and the data necessary to this user interface. This figure gives a static and dynamic illustration of the implementation.

25 According to the present exemplary embodiment, the television receiver comprises applications (160) including on the one hand a user interface application (190) and on the other hand so-called external applications (180). The applications communicate with
30 the middleware (170) and moreover with an access control module (150). The latter two communicate moreover with an Open TV module (100). In this configuration where the central element is the Open TV module, the latter communicates with a teletel module
35 (110), a drivers adaptation module (120), and with a kernel of the operating system ("OS kernel") (140). The drivers adaptation module (120) is moreover connected to the module of the drivers (130), to the OS kernel and to the conditional access module. It also

communicates with loader software (198) which makes it possible to initiate the starting of the system.

In the present configuration, the Open TV module (100) incorporates on the one hand the interpreter for the multimedia applications and on the other hand the libraries devoted to interactive television such as the graphics display functions, the functions for managing interactions, the broadcasting stacks, the communications stacks, etc. Any other system exhibiting the same functions could as well replace it.

The digital signals which are transmitted to the receiver are in the form of packets. They are separated so as each to represent a type of information or simply a "path". Thus, the digital television signals comprise a video path, an audio path and a "service path". It is in this service path that events information tables commonly referred to as "service information" are provided.

In a digital environment, each stream groups together a plurality of "services" which may in their turn be grouped together in a digital bouquet which can bring together "services" of several broadcasters. Consequently, in this complex environment, it is desirable for the signals transmitted for each "service" to contain information which can be extracted directly.

The environment described above is cited by way of example. The present invention can be used in another environment in which the concepts of "services" or of bouquets are replaced by other concepts, provided that the signals received by the subscribers contain the information which makes it possible to identify the "services", "programmes", "broadcasts" or "events" which they receive.

The MPEG-2 Systems standard, together with the DVB-SI standard, gives an example of the general organization of the "information services" in a European digital television context. This context is

illustrated solely by way of example in order to understand the present invention.

The tables which are most typically useful for virtual zapping are the NIT, BAT for the list of services, SDT for the names of the services and EIT for the names of the events. The "information service" (SI) which consists mainly of these tables provides among other things information as follows:

• a bouquet association table "BAT" which provides the information relating to the bouquets such as the name of the "services" which are provided.

• A NIT table, which mainly gives information on the physical characteristics of the stream (frequencies on which the various streams are transmitted).

• A "services" description table (SDT) which contains the data describing the "services" in the system.

• An events information table "EIT" which contains the data on the events or programmes such as the name, the start, the duration etc.

• A running status table "RST" which gives the state ("currently broadcasting" or "not currently broadcasting") of an event.

• A diary table "TDT" which gives information on the current time and the date. This table is updated so as to accommodate the local times and to be exact.

This description is not exhaustive, other tables may be set in place to contain other information which is useful within the framework of the present invention. Moreover, reference will be made to the aforesaid standards for more specific teachings regarding the various tables, their structure and their content.

Figure 3 represents the database of the server service and its relations with the software elements of the system in the execution of the virtual zapping function.

The virtual zapping whose function was explained earlier, enables the user to scroll the

stations or services one by one in an ascending or descending manner in a menu without however having to display the programme or the event on the screen of the television set. This scrolling is of the order of
5 0.4 seconds per station or service. When the pressure on the P+ or P- programme buttons is released, the connection is established (that is to say the demultiplexer is programmed to demultiplex the packets corresponding to the elementary streams of the
10 programme or of the event) and the corresponding programme or event is displayed on the screen.

The virtual zapping process is performed in several steps. When the P+ or P- button is first pressed, the middleware advises that the service must
15 change, identifying the new service requested by means of the "service identifier". The response as well as the service requested are then transmitted to the middleware within 0.4 seconds. If the user does not release the button, an automatic mechanism placed on a
20 time counter or "timer" relaunches this procedure. The process therefore continues in this way until the user releases the pressure signifying that he is satisfied with the service or the programme provided. Figure 3 describes the main element of the server service module
25 together with the entry points (functions or "methods") which it offers to the user interface module (UI). Some of these methods enable the UI to consult the current list of services, to ascertain the names of the services. A pair of methods Lock/Unlock makes it
30 possible to suspend/resume the updating of the database from the stream so that the UI is temporarily furnished with a consistent image (although possibly outdated) of the list of services.

Figure 4 shows a representation of the "server
35 service" module as an object model together with its internal components and its links with external components.

The module of the server service comprises a main component which is a database (300). It

communicates with three other components which are: an installer (310), a data stream verification module (320) and a names verification module (330).

5   These four components are moreover linked up to a module of the user interface (340), a controller (350), a module of the information service (360) of Open TV (or similar system), and a module for managing the tables of the Open TV information service (370).

10   In the execution of the functions, the installer (310) firstly erases the database (300); this is achieved by means of a particular function. It then carries out the comparison between several lists derived from the tables NIT and BAT so as to pick the elements in common and obtain consistent lists. This

15 depends of course on the environment which is in place. In the installation mode, the aim is to ascertain when the database is furnished with the complete data relating to certain particular services which have to be recognized right from the outset. The list of

20 services is loaded immediately on start-up (read from the NIT and BAT). However, this list contains only the services numbers and their DVB identification, the "user" information (describing the services in a manner comprehensible to the user: title, resumé etc.) have

25 not yet been loaded, so as to avoid having to wait for all the data to be downloaded. Next, the propagation mode makes it possible to ascertain whether the data need to be recorded immediately in the database. As soon as the downloading of the services has terminated,

30 all the lists of services are constructed and the available database (restitution database) is updated. A "timer" is triggered so as to despatch a message advising that the database is full or will be filled.

    The database (300) is furnished with a

35 structure which allows it to respond rapidly to the user's commands and a detailed description of which is given in Figure 5. To do this, this database must be capable of interpreting the instructions which are despatched to it.

The function of the controller (350) is to cooperate with the installer module (310) so as to initialize the database (300). The latter acquires information regarding the information service by virtue

5   of the module of the information service (360) of the Open TV system. Once this information has been acquired, it can be provided to the stream verification module (320) and to the names verification module (330).

10   The name verification module (330) executes the following functions: it translates the names of the service into a DVB-SI comprehensible language. It notifies the controller that the connection is established. It then updates the information in the

15   Open TV system.

The stream verification module (320) for its part updates the information for each data stream detected appearing in the list of services which are available to the user.

20   As soon as the information of the requested service has been acquired and the image is stable, the database (300) despatches a message to the user interface module (340) advising that the transmission is ready. The latter module then proceeds to the

25   reading of the database so that the service or the programme requested is displayed on the screen.

Figure 4 represents the internal architecture of the database of the server service together with its links with the data streams.

30   The database can be divided into two parts. The first part relates to the acquisition of the information from the service module (360) of the Open TV system and also to the processing of advisory messages so that the information received and stored in

35   this first part is not stable but is constantly evolving with the updating of the stream. The second part stores the image of these data, this image being intended for restitution at the user. It is controlled by the acquisition part, and the data are swapped from

the acquisition part to the restitution part at particular moments. The aim of the restitution part is to provide as stable as possible a copy of the data of the DVB stream. Therefore, it takes on a dual function.

5   On the one hand, it administers the user's requests and provides a sorting of the database. On the other hand, it plays the role of database, the structure of which is destined to be identical to that of the acquisition part. To do this, the content of the acquisition part

10   is of course linked to the restitution part.

This database (300) implements several classes, each class corresponding to a particular object of the service information. Each class comprises a list of methods allowing the construction of the database for

15   this class. The methods make it possible in particular to indicate which parameters of the descriptors need to be stored for each object.

In its construction, this database comprises several components: an internal service module (412)

20   associated with a service connection module (416). These modules contain data which can be accessed by the module dedicated to television (440), a module dedicated to radio (430), a module dedicated to downloading (420) and a module managing the service

25   lists (410). The module dedicated to television also accesses the data of an event module (442) which in turn can be associated with other modules containing ancillary data regarding the events. These are for example modules containing the details (446) or the

30   extensions (444) regarding the events.

As was mentioned earlier, these modules do not all contain information which is immediately necessary. Only the service module (412), the service connection module (416), and the event module (442) contains some.

35   The service module (412) actually records information regarding the identification of the original network, of the transponder, of the service, of the station and information regarding the type of DVB etc.

The service connection module (416) contains information regarding the type of connection, the name of the connection, the identification of the connection station and the type of DVB connection.

5   The event module (442) contains the information regarding the identification of the event, the start of the event, the duration, the name of the event and its status.

As constructed, the database (300) is subject
10   to various manipulations.

When the list of services changes, this being the case in particular when the BAT or NIT table changes, the database (acquisition part) is erased and the list of services is recompiled for all the
15   services. The restitution part is updated when the entire list of services has been received by the database, the acquisition part. This updating takes place when the list of services has been acquired, but before the supplementary information relating to each
20   service has been demultiplexed.

According to a variant embodiment, the updating of the restitution part of the database is updated after expiry of a predetermined timespan, with respect to the instigating of the update of the acquisition
25   part. This makes it possible to avoid too long a wait for this updating in the case where the acquisition of the list of services is difficult.

When a service changes in the DVB stream, its copy in the acquisition part of the database is
30   updated, as are the data associated therewith, such as the information relating to its connection, i.e. the address of the service in the television network. The restitution part is updated only when a particular message of a software element of the decoder, for
35   example an application, so requests. This occurs in particular in the case where the events information table "EIT" changes in the DVB stream.

Thus, according to the type of service information, the updating of the restitution part is

either automatic, or is performed only when
specifically requested. It is thus possible to avoid
inopportune updates which could result in problems with
the behaviour of certain applications which are not
5 envisaged for dealing with abrupt changes in the
service data. In particular, if all the updates
relating to the information of a given service are not
performed at the same time in the restitution part,
then inconsistencies may arise temporarily between data
10 which have been updated and data which have not yet
been updated.

According to a particular embodiment of the
invention, the fact that the updating of the
restitution part, following an updating of the
15 acquisition part, is done immediately or when
requested, can be programmed at the level of the
classes corresponding to each type of information.

When the current service changes, the specific
information connected with the service is updated in
20 the data acquisition part. The database available (that
is to say the restitution part) is updated only when
the occasion presents itself.

The aim of the database updating message is to
update the entire database. Updating begins first for
25 each service and then for the current service. After
the modifying of the database, the propagation mode
starts so as to speed up the modification. A message is
then sent to the user to advise him that the entire
database has been modified.

30 The pair of Lock/Unlock methods makes it
possible to suspend/resume the updating of the database
from the stream. Thus, the user interface is furnished
with a consistent image of the list of services.

It is important to note that the term decoder
35 is used in this description in a generic manner. It may
be replaced by a package of electronic components whose
functionalities are those for example of a "network
computer" which is linked to any telephone or
telecommunication network.

Claims

1.   Process for managing service data in a television system in which the said service data are transmitted, characterized in that it comprises the steps:

- of acquiring service data and of storing the data acquired in a first database of a receiver;

- of copying service data stored in the said first database to a second database of the receiver for the updating of the said second base;

- of making the data stored in the said second database available to at least one application of the said receiver.

2.   Process according to Claim 1, characterized in that the updating of the second database is performed immediately after acquiring a service datum.

3.   Process according to Claim 1 or 2, characterized in that the updating of the second database is performed after a predetermined time interval after a request for acquisition of a service datum.

4.   Process according to one of Claims 1 to 3, characterized in that the updating of the second database is performed only following a request of an application.

5.   Process according to one of Claims 2 to 4, characterized in that the moment of the update according to one of Claims 2 to 4 is dependent on the type of the service datum.

6.   Process according to one of the preceding claims, characterized in that it furthermore comprises the steps:

- of acquiring the list of services broadcast and of supplementary information relating to the services of the said list;

- of storing the information in the first database and of updating the second database;

- should a change of service be detected, acquiring new supplementary information relating to this service and suspending the updating of the second base with the new supplementary information until a request of an application.

7.   Television receiver in a television system with transmission of service data, characterized in that it comprise:

- means for acquiring service data;
- means for storing a first service database;
- means for storing a second service database;
- means for suspending and resuming updating of the second database from the first database.